National Institute of Environmental Health Sciences

Development, malaria and adaptation to climate change: A case study from India

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Year: 2009
Journal: Environmental Management. 43 (5): 779-789

Abstract:

India has reasons to be concerned about climate change. Over 650 million people depend on climate-sensitive sectors, such as rain-fed agriculture and forestry, for livelihood and over 973 million people are exposed to vector borne malarial parasites. Projection of climatic factors indicates a wider exposure to malaria for the Indian population in the future. If precautionary measures are not taken and development processes are not managed properly some developmental activities, such as hydro-electric dams and irrigation canal systems, may also exacerbate breeding grounds for malaria. This article integrates climate change and developmental variables in articulating a framework for integrated impact assessment and adaptation responses, with malaria incidence in India as a case study. The climate change variables include temperature, rainfall, humidity, extreme events, and other secondary variables. Development variables are income levels, institutional mechanisms to implement preventive measures, infrastructure development that could promote malarial breeding grounds, and other policies. The case study indicates that sustainable development variables may sometimes reduce the adverse impacts on the system due to climate change alone, while it may sometimes also exacerbate these impacts if the development variables are not managed well and therefore they produce a negative impact on the system. The study concludes that well crafted and well managed developmental policies could result in enhanced resilience of communities and systems, and lower health impacts due to climate change.

Source: http://dx.doi.org/10.1007/s00267-008-9242-z

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Meteorological Factors, Precipitation, Temperature

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: India

Health Co-Benefit/Co–Harm (Adaption/Mitigation): ☒

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Malaria

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Outcome Change Prediction, Other Projection Model/Methodology

Other Projection Model/Methodology: discussion only

Resource Type: ☒

format or standard characteristic of resource

Research Article, Research Article

Resilience: ☒

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale: ☒

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

Climate Change and Human Health Literature Portal

A focus of content